$AF/2633
IFW

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

ATTORNEY DOCKET NO. **10004333-1**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Kent W. Carey

Serial No.: 09/961,119 **Examiner: Payne, David C.**

Filing Date: September 20, 2001 **Group Art Unit: 2633**

Title: Methods of Optical Communication and Optical Communication Systems

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on January 17, 2006 .

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) **$500.00**.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)(1)-(5)) for the total number of months checked below:

☐	one month	$ 120.00
☐	two months	$ 450.00
☐	three months	$1020.00
☐	four months	$1590.00

☐ The extension fee has already been filled in this application.

☒ (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **50-3718** the sum of $500.00 . At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **50-3718** pursuant to 37 CFR 1.25.

A duplicate copy of this transmittal letter is enclosed.

☒ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Deposit: March 17, 2006 **OR**

☐ I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Date of Facsimile:

Typed Name: Michele Morrow

Signature: Michele Morrow

Respectfully submitted,

Kent W. Carey

By _____

Gerald H. Glanzman
Attorney/Agent for Applicant(s)

Reg. No. 25,035

Date: March 17, 2006

Telephone No. 972-385-8777

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

Docket No. 10004333-1 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Kent W. Carey**	§	
	§	Group Art Unit: **2633**
Serial No. **09/961,119**	§	
	§	Examiner: **Payne, David C.**
Filed: **September 20, 2001**	§	
	§	
For: **Methods of Optical Communication and Optical Communication Systems**	§	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate of Mailing Under 37 C.F.R. § 1.8(a)
I hereby certify this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on March 17, 2006.

By: Michele Morrow
Michele Morrow

APPEAL BRIEF (37 C.F.R. 41.37)

This brief is in furtherance of the Notice of Appeal, filed in this case on January 17, 2006.

A fee of $500.00 is required for filing an Appeal Brief. Please charge this fee to Avago Technologies Deposit Account No. 50-3718. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to Avago Technologies Deposit Account No. 50-3718. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to Avago Technologies Deposit Account No. 50-3718.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

REAL PARTY IN INTEREST

The real party in interest in this appeal is the following party:

Avago Technologies General IP (Singapore) Pte. Ltd. (Company Registration No. 200512430D), a company incorporated under the laws of Singapore whose registered office is at 8 Cross Street, #11-00 PWC Building, Singapore 048424.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 1-36

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: 6, 10, 15, 24 and 29
2. Claims withdrawn from consideration but not canceled: NONE
3. Claims pending: 1-5, 7-9, 11-14, 16-23, 25-28 and 30-36
4. Claims allowed: NONE
5. Claims rejected: 1-5, 7-9, 11-14, 16-23, 25-28 and 30-36
6. Claims objected to: NONE

C. CLAIMS ON APPEAL

The claims on appeal are: 1-5, 7-9, 11-14, 16-23, 25-28, and 30-36

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

STATUS OF AMENDMENTS

An Amendment after Final Office Action was not filed. Accordingly, the claims on appeal herein are as amended in the Response to Office Action filed August 26, 2005.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

SUMMARY OF CLAIMED SUBJECT MATTER

A. CLAIM 1 - INDEPENDENT

The subject matter of claim 1 is directed to a method of optical communication. A plurality of optical signals **23** and a plurality of data signals **13** are provided (see **Figure 1** and page 5, lines 7-10 and page 8, lines 7-9). A plurality of optical modulators **34, 34a, 34b, 34c** is also provided (see **Figures 3** and **4** and page 5, last line to page 6, line 3). Each of the plurality of optical modulators **34, 34a, 34b, 34c** receives one of the plurality of optical signals **23** and one of the plurality of data signals **13**; passes a desired portion of the received optical signal **23**, the passed desired portion of the received optical signal **23** having at least one predefined wavelength; optically modulates the passed desired portion of the received optical signal **23** responsive to the received data signal **13** to provide an optically modulated passed desired portion **25** of the received optical signal **23** (see, for example, page 6, lines 3-8 and page 7, last line to page 8, line 6); and outputs the optically modulated passed desired portion **25** of the received optical signal **23** to an optical communication medium **28** (see **Figure 1** and page 9, lines 8-14).

B. CLAIM 9 – INDEPENDENT

The subject matter of claim 9 is directed to a method of optical communication. An optical signal **23** and a data signal **13** are provided (see **Figure 1** and page 5, lines 7-10 and page 8, lines 7-9). The optical signal **23** and the data signal **13** are received within an optical modulator **34, 34a, 34b, 34c** (see page 7, lines 8-10). The data signal **13** is encoded upon at least a portion of the optical signal **23** by optically modulating at least the portion of the optical signal using frequency modulation (see page 6, lines 9-11). At least the portion of the optical signal **23** is output to an optical communication medium **28** after the encoding, wherein the optical modulator includes a filter having a pass band (see page 10, lines 24-29 and page 11, line 26 to page 12, line 1 and cavities **42, 42a, 42b, 42c** in **Figures 3** and **4**), and wherein the encoding comprises frequency modulating at least the portion of the optical signal within the pass band (see page 6, lines 9-11).

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

C. CLAIM 13 – INDEPENDENT

The subject matter of claim 13 is directed to an optical communications method. A source-light beam **21** is divided into plural carrier-light beams **23** (page 5, lines7-10), and the carrier-light beams **23** are modulated responsive to respective data signals **13** to yield plural encoded-light beams **25**, wherein the encoded light beams **25** have different respective encoded-light wavelengths (see page 10, lines 20-24). The encoded-light beams **25** are combined to yield a multiplexed-light beam **27**, wherein the combining step comprises frequency-multiplexing the encoded light beams (see page 9, lines 14-16).

D. CLAIM 19 – INDEPENDENT

The subject matter of claim 19 is directed to an optical communication system **10**. The system includes a plurality of optical modulators **34**, **34a**, **34b**, **34c** (see **Figures 3** and **4**) adapted to optically couple with a plurality of optical signals **23** and an optical communication medium **28** (see **Figure 1**). Each of the plurality of optical modulators **34**, **34a**, **34b**, **34c** is configured to receive a data signal **13**; pass a desired portion of the coupled optical signal **23**, the desired portion having at least one predefined wavelength; optically modulate the passed desired portion of the coupled optical signal **23** having the at least one predefined wavelength responsive to the received data signal **13** to provide an optically modulated passed desired portion **25** of the coupled optical signal **23** (see, for example, page 6, lines 3-8 and page 7, last line to page 8, line 6); and output the optically modulated passed desired portion **25** of the coupled optical signal **23** for application to the optical communication medium **28** (see page 9, lines 8-14).

E. CLAIM 27 – INDEPENDENT

The subject matter of claim 27 is directed to an optical communication system **10**. The system includes a light source **20** for providing a source-light beam **21**, and an optical divider **22** which converts the source-light beam **21** into plural carrier-light beams **23** (see **Figure 1**). A

modulator array **24** converts the carrier-light beams **23** into encoded-light beams, the modulator including means (electrodes **44, 46,** page 11, lines 22-24) for receiving plural data signals **13**, the modulator array **24** converting each of the carrier-light beams into a respective one of the encoded-light beams as a function of a respective one of the data signals, wherein each of the encoded-light beams has a respective encoded-light wavelength with no two of the encoded-light beams having the same encoded-light wavelength (see, for example, page 10, lines 20-24). An optical combiner **26** combines the encoded-light beams to yield a multiplexed light beam **27**, the optical combiner frequency multiplexing the encoded-light beams to yield the multiplexed-light beam (see page 9, lines 14-16).

F. CLAIM 2 - DEPENDENT

The subject matter of claim 2, which depends from claim 1, further requires that the step of optically modulating the passed desired portion of the optical signal **23** comprises frequency modulating the passed desired portion of the optical signal **23** (see page 6, lines 9-11).

G. CLAIM 12 – DEPENDENT

The subject matter of claim 12, which depends from claim 9, further requires that the receiving comprises receiving at least the portion of the optical signal within an optical modulator having a filter frequency, and the encoding comprises frequency modulating the filter frequency (see page 8, line 25 to page 9, line 7).

H. CLAIM 20 – DEPENDENT

The subject matter of claim 20, which depends from claim 19, further requires that the optical modulators **34, 34a, 34b, 34c** be configured to frequency modulate the desired portions of the coupled optical signal (see page 6, lines 9-11).

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. GROUND OF REJECTION 1 (Claims 1-3, 7, 8, 13, 14, 17-19, 21, 26-28, 31-33, 35)

Claims 1-3, 7, 8, 13, 14, 17-19, 21, 26-28, 31-33 and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knox et al. (US Patent No. 5,526,155 A).

B. GROUND OF REJECTION 2 (Claims 4, 5, 9, 11, 12, 20, 22, 23)

Claims 4, 5, 9, 11, 20, 22 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knox et al. in view of Roberts (US Patent No. 6,313,932 B1) and Wilner et al. (US Patent No. 6,341,021 B1).

C. GROUND OF REJECTION 3 (Claims 16, 25, 30, 34, 36)

Claims 16, 25, 30, 34 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knox et al. in view of Young et al. (US Patent No, 5,760,941 A).

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

ARGUMENT

A. GROUND OF REJECTION 1 (Claims 1-3, 7, 8, 13, 14, 17-19, 21, 26-28, 31-33, 35)

Claims 1-3, 7, 8, 13, 14, 17-19, 21, 26-28, 31-33 and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knox et al. (US Patent No. 5,526,155 A).

A.1. Claims 1, 3, 7, 8, 19, 21, 26, 33, 35

In rejecting the claims, the Examiner states as follows:

> Re claims 1, 2, 3, 7, 8, 13, 14, 17-19, 21, 26-28, 31-33, 35 Knox disclosed a broadband frequency spectrum source (11 of Figure 2) that is split into a plurality of different carrier wavelengths (20, 22 of Figure 2) after splitting by a diffraction grating (18) the plurality of signals are then modulated by an array of modulators (26 of Figure 2) responsive to data signals (29 of Figure 2) which are then recombined by the diffraction grating (18) which are then output to a desired transmission medium (34 of Figure 2), see col. 7, lines 1-50. Knox does not disclose the literal "passing a plurality of desire portions of the optical signal using a plurality of modulators...". However, Knox disclosed that a portion of the signal from source (11) out of the pick-off mirror (14) is incident on grating (18), see col. 6, lines 54-60. It would have been obvious to one of ordinary skill in the art at the time of invention that not only a portion of the source signal (11) is modulated as evidenced by the preceding passage, but also each modulator (27) in the array (26) receives a portion of the wavelength split beam. Furthermore, every wavelength emitted from the light source is predefined by definition of the inventor having knowledge of the desired light source.

Final Office Action dated November 14, 2005, page 4.

Claim 1 on appeal herein is as follows:

> 1. A method of optical communication comprising:
> providing a plurality of optical signals;
> providing a plurality of data signals;

providing a plurality of optical modulators, each of the plurality of optical modulators:

receiving one of the plurality of optical signals and one of the plurality of data signals;

passing a desired portion of the received optical signal, the passed desired portion of the received optical signal having at least one predefined wavelength;

optically modulating the passed desired portion of the received optical signal responsive to the received data signal to provide an optically modulated passed desired portion of the received optical signal; and

outputting the optically modulated passed desired portion of the received optical signal to an optical communication medium.

Knox does not disclose or suggest "passing a desired portion of the received optical signal, the passed desired portion of the received optical signal having at least one predefined wavelength" and "optically modulating the passed desired portion of the received optical signal responsive to the received data signal to provide an optically modulated passed desired portion of the received optical signal" as recited in claim 1.

Knox discloses an optical wavelength division multiplexing device. The device is illustrated in Figure 2 of Knox, and as acknowledged by the Examiner, the device includes diffraction grating 18 that divides light from light source 11 into a plurality of optical signals. The plurality of optical signals is then directed to array 26 of modulators 27 where they are modulated responsive to a plurality of data signals. The modulated optical signals are then recombined by diffraction grating 18.

In Knox, diffraction grating 18 divides the light into a plurality of optical signals and the plurality of optical signals is directed to a plurality of modulators to be modulated. Nowhere does Knox disclose or suggest that a desired portion of the optical signals received by the modulators of the plurality of modulators are passed by the optical modulators, and that the passed desired portion of the optical signals are optically modulated. In Knox, it is the optical signals as received by the modulator array that are modulated, and not a "passed desired portion of the received optical signal". Even though, as contended by the Examiner, the diffraction grating in Knox may cause light of different wavelengths to impinge on the modulator array, this is not a disclosure that the modulators in the modulator array in Knox pass "a desired portion of the received optical signal, the passed desired portion of the

received optical signal having at least one predefined wavelength" as recited in claim 1. In Knox, the modulators in the modulator array modulate and pass the entire received optical signals, not a desired portion of the optical signals they receive.

In responding to Appellant's comments in the Response to Office Action filed December 27, 2004, the Examiner states:

> Applicant's arguments with respect to Knox however are not persuasive. Applicant alleges that Knox does not teach "passing a desired portion of the received optical signal...". The Examiner looks to the applicant's specification of "passing a desire portion of the received optical signal". It appears that the specification is silent beyond reciting the exact words which have been cited in the claim. Furthermore, it appears that a portion of the desired signal can only refer to the fact that a divided signal is therefore a desired portion. Obviously a wavelength splitter that causes different wavelengths to impinge on the modulator array in Knox is in fact passing a desired portion of the signal. This is extremely clear from a comparison of the applicant's disclosure and the prior art. Thus the applicant arguments are not persuasive.

Office Action dated May 31, 2005, page 2.

The Examiner also states that he maintains this position on page 2 of the Final Office Action dated November 14, 2005.

Appellant respectfully disagrees with the Examiner's conclusions. Initially, the Examiner is incorrect in stating that the specification is silent beyond reciting the exact words "passing a desired portion of the received optical signal" contained in claim 1. The specification, in fact, includes substantial disclosure regarding this aspect of the invention. For example, in lines 12-15 of paragraph [0026] on page 7 it is stated:

> Alternatively, filtering of light from individual optical signals 23 is implemented by the optical modulators to remove undesired light from optical signals 23.

Further, in paragraph [0027] on pages 7 and 8 it is stated:

> In an alternative implementation of optical communication system 10, divider 22 provides no wavelength division but rather divides optical signal 21 into optical signals 23 which individually have substantially the same wavelength spectrum as signal 21. Accordingly, optical signals 23 comprise broad spectrum signals in such an embodiment. Optical modulators of array 24 filter and modulate the broad spectrum signals 23 providing optical signals 25 as described above. In such an arrangement, the optical modulators are configured to filter undesired portions of optical signals 23 outside of the respective passbands of the optical modulators and to pass and to modulate the respective desired portions of optical signals 23. (Emphasis added.)

Yet further, paragraphs [0037] – [0043] on pages 10-12 of the specification describe in substantial detail exemplary embodiments in accordance with the invention by which desired portions of received optical signals are passed and modulated by the plurality of optical modulators.

Thus, Appellant submits that the specification is not silent beyond reciting the exact words "passing a desired portion of the received optical signal...", but fully and completely discloses this aspect of the present invention.

Appellant also respectfully disagrees with the Examiner's assertion that "Obviously a wavelength splitter that causes different wavelengths to impinge on the modulator array in Knox is in fact passing a desired portion of the signal." As discussed above, each modulator in the modulator array in Knox appears to modulate and pass the entire optical signal it receives, not a desired portion of the received optical signal. At best, the splitter in Knox might correspond to divider 22 in the exemplary embodiment in accordance with the invention illustrated in Figure 1, but it does not, in any way, correspond to the modulator array in Knox passing desired portions of received optical signals.

For at least all the above reasons, claim 1 is not obvious in view of Knox, and patentably distinguishes over Knox in its present form.

Claims 3, 7, 8 and 33 depend from and further restrict claim 1, and are also not obvious in view of Knox, at least by virtue of their dependency.

Independent claim 19 recites similar subject matter as claim 1, and patentably distinguishes over Knox for substantially the same reasons as discussed above with respect to claim 1. Claims 21, 26 and 35 depend from and further restrict claim 19 and also patentably distinguish over Knox, at least by virtue of their dependency.

A.2 Claims 13, 14, 17, 18, 27, 28, 31, 32

Claim 13 on appeal herein is as follows:

> 13. An optical communications method comprising:
> dividing a source-light beam into plural carrier-light beams;
> modulating said carrier-light beams responsive to respective data signals to yield plural encoded-light beams, wherein said encoded light beams have different respective encoded-light wavelengths; and
> combining said encoded-light beams to yield a multiplexed-light beam, wherein said combining step comprises frequency-multiplexing said encoded light beams.

Knox nowhere discloses or suggests "combining said encoded-light beams to yield a multiplexed-light beam, wherein said combining step comprises frequency-multiplexing said encoded light beams' as recited in claim 13.

In Col. 7, lines 51-62, Knox discloses that diffraction grating 18 therein functions both as a wavelength splitter and a wavelength combiner, or that a separate wavelength combiner may be used to recombine the modulated optical signals. Knox does not, however, disclose in any way that the "combining step comprises frequency-multiplexing said encoded light beams", nor has the Examiner identified any such disclosure in Knox or commented in any way regarding claim 13, as to why it would be obvious to modify Knox to achieve the invention recited in claim 13.

Claim 13, accordingly, also patentably distinguishes over Knox in its present form.

Claims 14, 17 and 18 depend from and further restrict claim 13, and also patentably distinguish over Knox, at least by virtue of their dependency.

Independent claim 27 contains limitations similar to claim 13, and patentably distinguishes over Knox for substantially the same reasons as discussed above with respect to claim 13. Claims 28, 31 and 32 depend from and further restrict claim 27 and are also not obvious in view of Knox, at least by virtue of their dependency from claim 27.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

A.3 Claim 2

Claim 2 depends from claim 1 and additionally recites that "optically modulating the passed desired portion of the optical signal comprises frequency modulating the passed desired portion of the optical signal". Knox does not disclose frequency modulation as was acknowledged by the Examiner in paragraph 5 on page 3 of the Office Action dated May 31, 2005, and in the first paragraph on page 5 in the Final Office Action dated November 14, 2005. The Examiner has also not commented as to why it would be obvious in view of Knox to frequency modulate the passed desired portion of the optical signal as recited in claim 2.

The Examiner does refer to various paragraphs in US Patent No 6,313,932 of Rogers (cited against claims 4, 5, 9, 11, 12, 20, 22 and 23, and discussed hereinafter with respect to those claims) as disclosing frequency modulation on pages 2 and 3 of the Final Office Action dated November 14, 2005, but has not applied Roberts against claim 2, and has not indicated why it would be obvious in view of Knox to frequency modulate the passed desired portion of the optical signal as recited in claim 2. In any event, Appellant contends that the subject matter of claim 2 would also not be obvious over Knox considered alone or in view of Roberts, as will be discussed more fully hereinafter.

For at least all the above reasons, Appellant believes that claims 1-3, 7, 8, 13, 14, 17-19, 21, 26-28, 31-33 and 35 patentably distinguish over Knox in their present form, and it is respectfully requested that the Board reverse the Examiner's Final Rejection of those claims.

B. GROUND OF REJECTION 2 (Claims 4, 5, 9, 11, 12, 20, 22, 23)

Claims 4, 5, 9, 11, 20, 22 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knox et al. in view of Roberts (US Patent No. 6,313,932 B1) and Wilner et al. (US Patent No. 6,341,021 B1).

Independent claim 9 is as follows:

9. A method of optical communication comprising:
providing an optical signal;
providing a data signal;
receiving the optical signal and the data signal within an optical modulator;

> encoding the data signal upon at least portion of the optical signal by optically modulating at least the portion of the optical signal using frequency modulation; and
>
> outputting at least the portion of the optical signal to an optical communication medium after the encoding, wherein the optical modulator comprises a filter having a pass band, and wherein the encoding comprises frequency modulating at least the portion of the optical signal within the pass band.

In rejecting claim 9, the Examiner states:

> Roberts disclosed frequency modulators as a filter for either passing, filtering portions of the optical signal having different respective different wavelengths, see col. 3, lines 33-45. It would have been obvious to one of ordinary skill in the art at the time of invention to apply the frequency modulation and filtering system in Roberts to Know [sic] so as to modulate the entire spectrum with data and provide clear channel separation of signals.

Final Office Action dated November 14, 2005, page 5.

The Examiner also acknowledges that Knox does not teach passbands and further states:

> Wilner teaches modulators (OF1...fig. 1A) having a pass band for selecting the optical signal with a pass band, see col. 7 lines 20-37. It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate filter having a passband for selecting a desired portion of a signal and creating greater and reduce power dissipation, see col. 2 lines 60-64.

Final Office Action dated November 14, 2005, page 5.

The Examiner contends that Roberts discloses frequency modulators as a filter for either passing, filtering portions of the optical signal having respective different wavelengths. Appellant respectfully disagrees.

Roberts states in col. 10, lines 23-26 that actuation of modulating elements "allows a distinct spectral modulation to be introduced into the optical signal" within the transmitted pulse. Spectral modulation is described in detail in Col. 10, lines 32-63 of Roberts. Roberts discloses use of a Mach Zehnder interferometer to perform spectral modulation, and states in col. 10, lines 62-63 that the spectral modulation may be termed "Fourier modulation in the present context". Roberts accordingly, does not appear to disclose or suggest optical

modulators configured to modulate at least a portion of an optical signal using frequency modulation as recited in claim 9.

The Examiner refers to various recitations in Roberts on pages 2 and 3 of the Final Office Action as describing frequency modulation. These recitations, however, refer to spectral modulation being in the form of periodic or sinusoidal modulations in frequency space. It is not clear that this is the same as, and it does not appear to be the same as frequency modulation, particularly, in view of the description of spectral modulation in Roberts..

Wilner discloses, as shown, for example, in Fig. 1A, that after optical signals are modulated by modulators AO1....AOn, the modulated signals are combined by coupler 18. The combined signal is then fed back to the modulators using a feedback loop 22, and filters OF1....OFn in the feedback loop reconverts the combined signal back to separate signals to be directed to the modulators.

Thus, in Wilner, it is the combined, modulated signal outputs of the modulators that are filtered. There is no disclosure of an optical modulator comprising "a filter having a pass band" as recited in claim 9.

In general, neither Knox nor Roberts nor Wilner discloses or suggests "wherein the optical modulator comprises a filter having a pass band, and wherein the encoding comprises frequency modulating at least the portion of the optical signal within the pass band" as recited in claim 9. Claim 9, accordingly, not obvious in view of Knox, Roberts and Wilner, and should be allowable in its present form.

Claims 11 and 12 depend from and further restrict claim 9 and are also not obvious in view of the references, at least by virtue of their dependency.

Claim 20 depends from claim 19 and is also not obvious in view of the references for substantially the same reasons as discussed above with respect to claim 9, as well as by virtue of its dependency.

Claims 4 and 5 depend from and further restrict claim 1, and claims 22 and 23 depend from and further restrict claim 19, and these claims are not obvious over the references at least by virtue of their dependency.

Claims 12 and 20 also patentably distinguish over the references for the reasons discussed above with respect to claim 2, and should be allowable in their own right as well as by virtue of their dependency.

For at least all the above reasons, Appellant believes that claims 4, 5, 9, 11, 20, 22 and 23 patentably distinguish over Knox in view of Roberts and Wilner in their present form, and it is respectfully requested that the Board reverse the Examiner's Final Rejection of those claims.

C. GROUND OF REJECTION 3 (Claims 16, 25, 30, 34, 36)

Claims 16, 25, 30, 34 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knox et al. in view of Young et al. (US Patent No, ,5,760,941 A).

Claims 16, 25, 30, 34 and 36 depend from and further restrict one of independent claims 1, 13, 19 and 27. Young does not supply the deficiencies in Knox as discussed above. Accordingly, these claims patentably distinguish over the references in their present form, at least by virtue of their dependency.

For at least all the above reasons, Appellant believes that claims 16, 25, 30, 34 and 36 patentably distinguish over Knox in view of Young in their present form, and it is respectfully requested that the Board reverse the Examiner's Final Rejection of those claims.

Gerald H. Glanzman
Reg. No. 25,035
YEE & ASSOCIATES, P.C.
PO Box 802333
Dallas, TX 75380
(972) 385-8777

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

CLAIMS APPENDIX

The text of the claims involved in the appeal are:

1. A method of optical communication comprising:

providing a plurality of optical signals;

providing a plurality of data signals;

providing a plurality of optical modulators, each of the plurality of optical modulators:

receiving one of the plurality of optical signals and one of the plurality of data signals;

passing a desired portion of the received optical signal, the passed desired portion of the received optical signal having at least one predefined wavelength;

optically modulating the passed desired portion of the received optical signal responsive to the received data signal to provide an optically modulated passed desired portion of the received optical signal; and

outputting the optically modulated passed desired portion of the received optical signal to an optical communication medium.

2. The method of claim 1 wherein optically modulating the passed desired portion of the optical signal comprises frequency modulating the passed desired portion of the optical signal.

3. The method of claim 1 wherein the at least one predefined wavelength is different from the at least one predefined wavelength of desired portions of optical signals passed by others of the plurality of optical modulators.

4. The method of claim 1 wherein each of the plurality of optical modulators has a different pass band, and wherein the passing and the optically modulating comprise passing and optically modulating the desired portion of the optical signal within the pass band of the optical modulator and not passing and not optically modulating other portions of the optical signal outside of the pass band.

5. The method of claim 4 further comprising filtering the other portions of the optical signal using the optical modulator.

7. The method of claim 1 wherein providing a plurality of optical signals comprises:

dividing a source optical signal into the plurality of optical signals.

8. The method of claim 1 further comprising combining the optically modulated passed desired portion of the optical signal of each of the plurality of optical modulators before the outputting, wherein the optical communication medium comprises an optical fiber.

9. A method of optical communication comprising:

providing an optical signal;

providing a data signal;

receiving the optical signal and the data signal within an optical modulator;

encoding the data signal upon at least portion of the optical signal by optically modulating at least the portion of the optical signal using frequency modulation; and

outputting at least the portion of the optical signal to an optical communication medium after the encoding, wherein the optical modulator comprises a filter having a pass band, and wherein the encoding comprises frequency modulating at least the portion of the optical signal within the pass band.

11. The method of claim 9 further comprising filtering other portions of the optical signal outside of the pass band using the optical modulator.

12. The method of claim 9, wherein the receiving comprises receiving at least the portion of the optical signal within an optical modulator having a filter frequency, and the encoding comprises frequency modulating the filter frequency.

13. An optical communications method comprising:

dividing a source-light beam into plural carrier-light beams;

modulating said carrier-light beams responsive to respective data signals to yield plural encoded-light beams, wherein said encoded light beams have different respective encoded-light wavelengths; and

combining said encoded-light beams to yield a multiplexed-light beam, wherein said combining step comprises frequency-multiplexing said encoded light beams.

14. The method of claim 13 further comprising injecting said multiplexed-light beam into an optical communication channel.

16. The method of claim 13 wherein said carrier-light beams share a common carrier wavelength.

17. The method of claim 13 wherein said carrier-light beams have different respective carrier-light wavelengths.

18. The method of claim 17 wherein each carrier-light wavelength of a respective carrier-light beam is closer to the encoded-light wavelength of the respective encoded-light beam that to the encoded-light wavelength of any other of said encoded-light beams.

19. An optical communication system comprising:

a plurality of optical modulators adapted to optically couple with a plurality of optical signals and an optical communication medium, wherein each of the plurality of optical modulators are configured to:

receive a data signal;

pass a desired portion of the coupled optical signal, the desired portion having at least one predefined wavelength;

optically modulate the passed desired portion of the coupled optical signal having the at least one predefined wavelength responsive to the received data signal to provide an optically modulated passed desired portion of the coupled optical signal; and

output the optically modulated passed desired portion of the coupled optical signal for application to the optical communication medium.

20. The system of claim 19 wherein the optical modulators are configured to frequency modulate the desired portions of the coupled optical signal.

21. The system of claim 19 wherein the optical modulators are configured to pass the desired portions of the coupled optical signal having respective different wavelengths.

22. The system of claim 19 wherein the optical modulators have respective different pass bands, and the optical modulators are configured to pass and to modulate the desired portions of the coupled optical signal within the respective pass bands and to not pass and to not modulate other portions of the coupled optical signal outside of the respective pass bands.

23. The system of claim 22 wherein the optical modulators are configured to filter the other portions of the coupled optical signal.

25. The system of claim 19 further comprising a divider configured to divide a source optical signal into the plurality of coupled optical signals.

26. The system of claim 19 further comprising a combiner configured to receive the optically modulated passed desired portions of the coupled optical signal from the optical

modulators, to combine the optically modulated passed desired portions, and to provide the optically modulated passed desired portions to the optical communication medium, wherein the optical communication medium comprises an optical fiber.

27. An optical communication system comprising:

a light source for providing a source-light beam;

an optical divider for converting said source-light beam into plural carrier-light beams;

a modulator array for converting said carrier-light beams into encoded-light beams, said modulator including means for receiving plural data signals, said modulator array converting each of said carrier-light beams into a respective one of said encoded-light beams as a function of a respective one of said data signals, wherein each of said encoded-light beams has a respective encoded-light wavelength, no two of said encoded-light beams having the same encoded-light wavelength; and

an optical combiner for combining said encoded-light beams to yield a multiplexed light beam, said optical combiner frequency multiplexing said encoded-light beams to yield said multiplexed-light beam.

28. The system of claim 27 wherein said optical combiner injects said multiplexed-light beam into an optical communications channel.

30. The system of claim 27 wherein said carrier-light beams share a common carrier-light wavelength.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

31. The system of claim 27 wherein said plural carrier-light beams have respective carrier-light wavelengths, no two of said carrier-light beams having the same carrier-light wavelengths.

32. The system of claim 31 wherein the carrier-light wavelength for each of said carrier-light beams is closer to the encoded-light wavelength of the respective encoded-light beam than to the encoded-light wavelength of any other encoded-light beam.

33. The method of claim 1 wherein the plurality of optical signals have different wavelengths.

34. The method of claim 1 wherein the plurality of optical signals have the same wavelengths.

35. The system of claim 19 wherein the plurality of optical signals have different wavelengths.

36. The system of claim 19 wherein the plurality of optical signals have the same wavelengths.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

EVIDENCE APPENDIX

There is no evidence to be presented.

AVAGO TECHNOLOGIES, LTD.
P.O. Box 1920
Denver, Colorado 80201-1920

RELATED PROCEEDINGS APPENDIX

There are no related proceedings.